

## Ecological site R013XY042ID Loamy 12-16 PZ ARARL/PSSPS

Last updated: 9/23/2020  
Accessed: 04/25/2024

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### General information

**Provisional.** A provisional ecological site description has undergone quality control and quality assurance review. It contains a working state and transition model and enough information to identify the ecological site.

### MLRA notes

Major Land Resource Area (MLRA): 013X–Eastern Idaho Plateaus

Land Resource Region: B (Northwestern Wheat and Range)  
MLRA: 13 (Eastern Idaho Plateaus)

EPA EcoRegion: Level III (Middle Rockies)

### LRU notes

013X-Eastern Idaho Plateaus

Precipitation or Climate Zone: 12-16" P.Z.  
<https://soils.usda.gov/survey/geography/mlra/index.html>

### Classification relationships

No data.

### Ecological site concept

Site does not receive any additional water.

Soils are:

not saline or saline-sodic.

Moderately deep to very deep, with >35% gravels (<10") and cobbles (10-25") cover. skeletal within 20" of soil surface, fragment percentage increasing with depth strongly or violently effervescent in surface mineral 10".

textures usually range from sandy loam to silty clay loam in surface mineral 4".

Slope is < 30%.

Clay content is = <35% in surface mineral 4".

Site does not have an argillic horizon with > 35% clay.

### Associated sites

R013XY043ID	Shallow Silt Stone 12-16 PZ STAC/ACHY
R013XY044ID	Gravelly North 12-16 PZ ARARL/PSSPS

### Similar sites

R013XY044ID	Gravelly North 12-16 PZ ARARL/PSSPS
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**Table 1. Dominant plant species**

Tree	Not specified
Shrub	(1) <i>Artemisia arbuscula ssp. longiloba</i>
Herbaceous	(1) <i>Pseudoroegneria spicata</i>

## Physiographic features

This site occurs on undulating foothills and lower mountain side slopes on south and west exposures. Slopes range from 5-25 percent. Elevations range from 6200-6600 feet (1850-2000 meters).

This site occurs on undulating hill sides and ridge tops on south and west exposures. Slopes range from 5 to 30, occasionally up to 45 percent. Elevations range from 6200 to 6900 feet (1890 to 2100 meters).

**Table 2. Representative physiographic features**

Landforms	(1) Ridge
Flooding frequency	None
Elevation	6,200–6,900 ft
Slope	5–45%
Water table depth	20–60 in
Aspect	S, W

## Climatic features

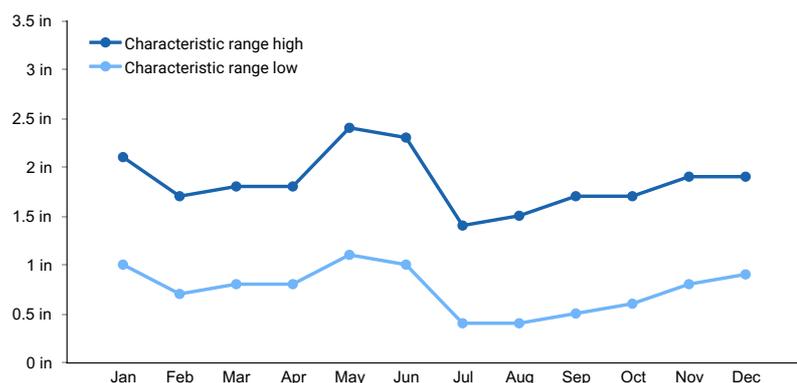
MLRA 13, the Eastern Idaho Plateaus, is part of the Northwestern Wheat and Range Region. Its elevation ranges from 4209 to 9331 feet above sea level, with an average elevation of 5787 feet. The average annual precipitation is 16.41 inches, with a range of 13.56 to 18.75 inches, based on ten long term climate stations located throughout the MLRA. A spike in precipitation amount often occurs in late spring, usually in May.

Temperatures vary widely in the MLRA throughout the year. A maximum temperature of 103° Fahrenheit occurred at the McCammon climate station (# 105716; elevation 4770 feet), while a minimum of -41° was recorded at the Kilgore station (#104908). At all stations temperatures throughout the year are usually below the national average. Kilgore also recorded the greatest annual snowfall amount of 217 inches. The average temperature is 41.4 degrees F. with an average high of 55.3 degrees and an average low of 27.5 degrees.

The frost-free period ranges from 64 to 90 days, while the freeze-free period can be 98 to 123 days.

**Table 3. Representative climatic features**

Frost-free period (average)	90 days
Freeze-free period (average)	123 days
Precipitation total (average)	19 in

**Figure 1. Monthly precipitation range**

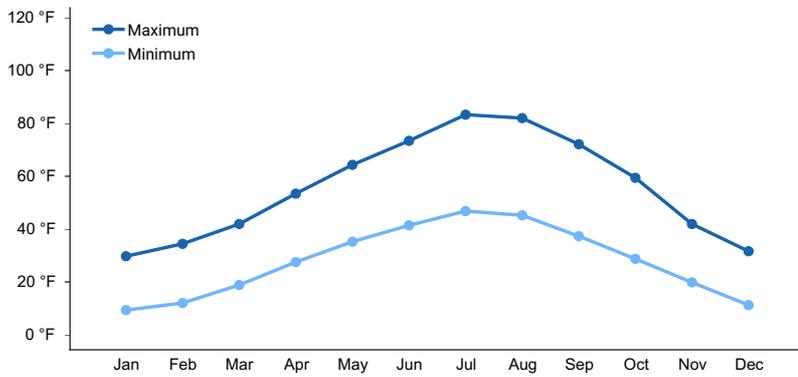


Figure 2. Monthly average minimum and maximum temperature

### Influencing water features

This site is not influenced by adjacent wetlands, streams, or run on.

### Soil features

The soils on this site are well drained and moderately deep to very deep to bedrock or fragmental layers. They occur on ridgetops, hillslopes, and fan terraces. They are formed in alluvium, slope alluvium and residuum from sandstone, calcareous siltstone, and mixed sources. Textures are dominantly very channery sandy loam, extremely channery sandy loam, silt loam, silty clay loam, and very gravelly loam.

The soils on this site are well drained and shallow to deep to bedrock. They occur on ridgetops and hillslopes. They are formed in alluvium, slope alluvium and residuum from limestone, calcareous siltstone, and mixed sources. Textures are dominantly loams and very gravelly silt loam. Runoff hazard is rapid to very rapid. The available water holding capacity (AWC) is very low to moderate while permeability is moderately slow to slow. These soils are characterized by a xeric soil moisture regime and a frigid soil temperature regime.

Soil Series Correlated to this Ecological Site

Every  
Mumford

Table 4. Representative soil features

Surface texture	(1) Gravelly loam (2) Very gravelly silt loam
Drainage class	Well drained
Permeability class	Moderately slow to moderate
Soil depth	10–60 in
Surface fragment cover <=3"	0–35%
Surface fragment cover >3"	0–5%
Available water capacity (0-40in)	1.1–5.6 in
Calcium carbonate equivalent (0-40in)	10–40%
Electrical conductivity (0-40in)	0–5 mmhos/cm
Sodium adsorption ratio (0-40in)	0–5

Soil reaction (1:1 water) (0-40in)	7.4–8.4
Subsurface fragment volume <=3" (Depth not specified)	30–50%
Subsurface fragment volume >3" (Depth not specified)	0–5%

## Ecological dynamics

### Ecological Dynamics of the Site:

The dominant visual aspect of this site is a shrub/grassland complex. Composition by weight is approximately 45-55 percent grasses, 10-20 percent forbs, and 30-40 percent shrubs.

During the last few thousand years, this site has evolved in a semi-arid climate characterized by warm, dry summers and cold, wet winters. Herbivory has historically occurred on the site at low levels of utilization. Herbivores include pronghorn antelope, mule deer, sage grouse, lagomorphs, and small rodents.

Fire has historically occurred on this site every 20-40 years.

The Historic Climax Plant Community (HCPC), the Reference State (State 1), moves through many phases depending on the natural and man-made forces that impact the community over time. State 1, described later, indicates some of these phases. The Reference Plant Community Phase is Phase A. This plant community is dominated by alkali sagebrush and bluebunch wheatgrass. Subdominant species include Indian ricegrass, Nevada bluegrass, thickspike wheatgrass, Hood's phlox, and biscuitroot. The plant species composition of Phase A is listed later under "Reference Plant Community Phase Plant Species Composition".

Total annual production is 900 pounds per acre (1008 Kg/ha) in a normal year. Production in a favorable year is 1100 pounds per acre (1232Kg/ha). Production in an unfavorable year is 650 pounds per acre (728Kg/ha). Structurally, cool season deep-rooted bunchgrasses are very dominant, followed by medium height shrubs and perennial forbs and shallow rooted perennial bunchgrasses are subdominant.

### FUNCTION:

This site is suited for grazing by domestic livestock in the summer and fall. Natural water supply is short or absent, however water may be available on adjacent sites. The site provides fair habitat for mule deer and sage grouse. This site provides open space on rolling slopes and lower mountain side slopes with a varied floristic component. The site has high run-off potential.

Due to the lack of surface stones and gentle slopes, this site is easily degraded by improper grazing management.

### Impacts on the Plant Community.

#### Influence of fire:

This site historically had a very low fire frequency, approximately every 20-40 years. Alkali sagebrush evolved in the absence of fire, therefore it can be severely damaged or killed when burned. Utah juniper will be killed after fire. Most of the grasses will have reduced vigor after fire. Little mortality is expected. Rabbitbrush species and snowberry can increase with fire. Cheatgrass can be a troublesome invader on this site after fire, preventing perennial grass and shrub re-establishment and increasing the fire frequency.

#### Influence of improper grazing management:

Season-long grazing and/or excessive utilization can be detrimental to this site. This type of management leads to reduced vigor of bluebunch wheatgrass and other deep-rooted perennial bunchgrasses. With reduced vigor, recruitment of these species declines. As these species decline, the plant community becomes susceptible to an

increase in alkali sagebrush, rabbitbrush, and invasive plants. Continued improper grazing management can lead to increased fire frequency as cheatgrass invades.

#### Weather influences:

Above normal precipitation in April, May, and June can dramatically increase total annual production. These weather patterns can also increase viable seed production of desirable species to provide for recruitment. Extended periods of drought significantly impact this site due to the low to medium available water holding capacity. Extended drought reduces vigor of the perennial grasses and shrubs. Extreme drought may cause plant mortality.

#### Influence of insects and disease:

Outbreaks can affect vegetation health, particularly bitterbrush from western tent caterpillars (*Malacosoma fragilis*). Two consecutive years of defoliation by the tent caterpillar can cause mortality in bitterbrush. Mormon cricket and grasshopper outbreaks occur periodically. Outbreaks seldom cause plant mortality since defoliation of the plant occurs only once during the year of the outbreak.

#### Influence of noxious and invasive plants:

Many of these species add to the fine-fuel component and lead to increased fire frequency. Annual and perennial invasive species compete with desirable plants for moisture and nutrients. The result is reduced production and change in composition of the understory.

#### Influence of wildlife:

Big game animals use this site in the spring, fall, and early winter. Their numbers are seldom high enough to adversely affect the plant community.

#### Watershed:

Decreased infiltration and increased runoff occur when alkali sagebrush is removed with frequent fires, particularly following the fire event. The increased runoff also increases sheet and rill erosion. Early spring grazing also causes trampling damage resulting in increased erosion. The long-term effect is a transition to a different state.

#### Influence of Utah juniper invasion:

In plant communities that are invaded by Utah juniper, the species has a competitive advantage for the following reasons:

- Utah juniper is very drought tolerant.
- It has the ability to extract soil moisture from a wide range of soil depths.
- Utah juniper has high evapo-transpiration rates.
- The species intercepts rain and snow before it reaches the soil surface.
- It has the ability to grow as long as there is soil moisture and the temperature is above freezing.
- Utah juniper has a relatively rapid growth rate and is long-lived. It can readily over-top shade intolerant species which leads to mortality.
- Nutrient cycling is reduced.
- As the canopy closes, Utah juniper gains control of energy capture

As Utah juniper extracts water, other plants are unable to acquire sufficient water and nutrients to sustain growth and reproduction, thus reducing cover and biomass in the interspaces. After the canopy closes, there is sufficient soil moisture available for shallow-rooted, shade tolerant species to persist directly under the tree.

The following hydrologic impacts occur on sites invaded by Utah juniper:

- Infiltration in the interspaces is reduced.
- Run-off increases resulting in increased sheet and rill erosion with elevated sediment loads.
- Soil temperatures increase in the interspaces which results in accelerated drying of the soil surface.
- Increased bare ground in the interspaces.

- Soil moisture storage is reduced.

As bare ground and interconnectiveness of bare ground increases, flow rates are accelerated (reduction of flow sinuosity) and run-off out of the area increases. Degradation of these systems can result in the formation of a feedback cycle in which greater Utah juniper cover and density results in greater plant and soil disturbance between the canopies.

In summary, a closed Utah juniper community takes control of the following ecological processes: (1) hydrology, (2) energy capture, and (3) nutrient cycling. The changes are primarily driven by the hydrologic processes. The development of a closed Utah juniper canopy always results in a transition across the threshold to a different state. Generally, when Utah juniper canopy cover nears 20%, the plant community is approaching the threshold.

Plant Community and Sequence:

Transition pathways between common vegetation states and phases:

State 1.

Phase A to B. Develops in the absence of fire. No Utah juniper seed source in the proximity.

Phase A to C. Usually results from improper grazing management and absence of fire. A Utah juniper seed source is present.

Phase A to D. Results from one or more fires.

Phase A to E. Develops in the absence of fire and improper grazing management. A Utah juniper seed source is present.

Phase A to F. Results from improper grazing management and absence of fire. No Utah juniper seed source is present.

Phase B to A. Results from prescribed grazing management.

Phase C to A. Develops with prescribed grazing management and prescribed burning or fire.

Phase D to A. Usually results from prescribed grazing management and no fire.

Phase E to A. Develops from prescribed grazing management and prescribed burning or brush management.

Phase F to A. Results from prescribed grazing management, no fire or brush management.

Phase B to D. This develops from prescribed burning or fire.

Phase C to D. This develops from prescribed burning or fire.

Phase E to D. Results from prescribed burning or fire.

Phase F to D. Results from prescribed burning or fire.

State 1 Phase D to State 2, Phase B. Develops through improper grazing management and frequent fire. This site has crossed the threshold. It is usually uneconomical to return this community to State1 through accelerated practices.

State 1 Phase F to State 2 Phase A. Develops through improper grazing management with no fire. This site has crossed the threshold. It is usually uneconomical to return this community to State1 through accelerated practices.

State 1 Phase C or E to State 3. Results from improper grazing management and lack of fire. This site has crossed the threshold. It is usually uneconomical to return this community to State1 through accelerated practices.

State 2 Phase A to State 2 Phase B. Results from improper grazing management and fire. This site has crossed the threshold. It is usually uneconomical to return this community to State1 through accelerated practices.

State 2 Phase B to State 2 Phase A. Results from no fire. This site has crossed the threshold. It is usually uneconomical to return this community to State1 through accelerated practices.

State 2 to unknown site. Excessive soil loss and changes in the hydrologic cycle caused by improper grazing management and/or frequent fire cause this state to cross the threshold and retrogress to a new site with reduced potential. It is usually uneconomical to return this community to State1 through accelerated practices.

State 3 to unknown site. Continued lack of fire and improper grazing management cause this state to cross the threshold and retrogress to a new site with reduced potential due to significant soil loss and changes in hydrology.

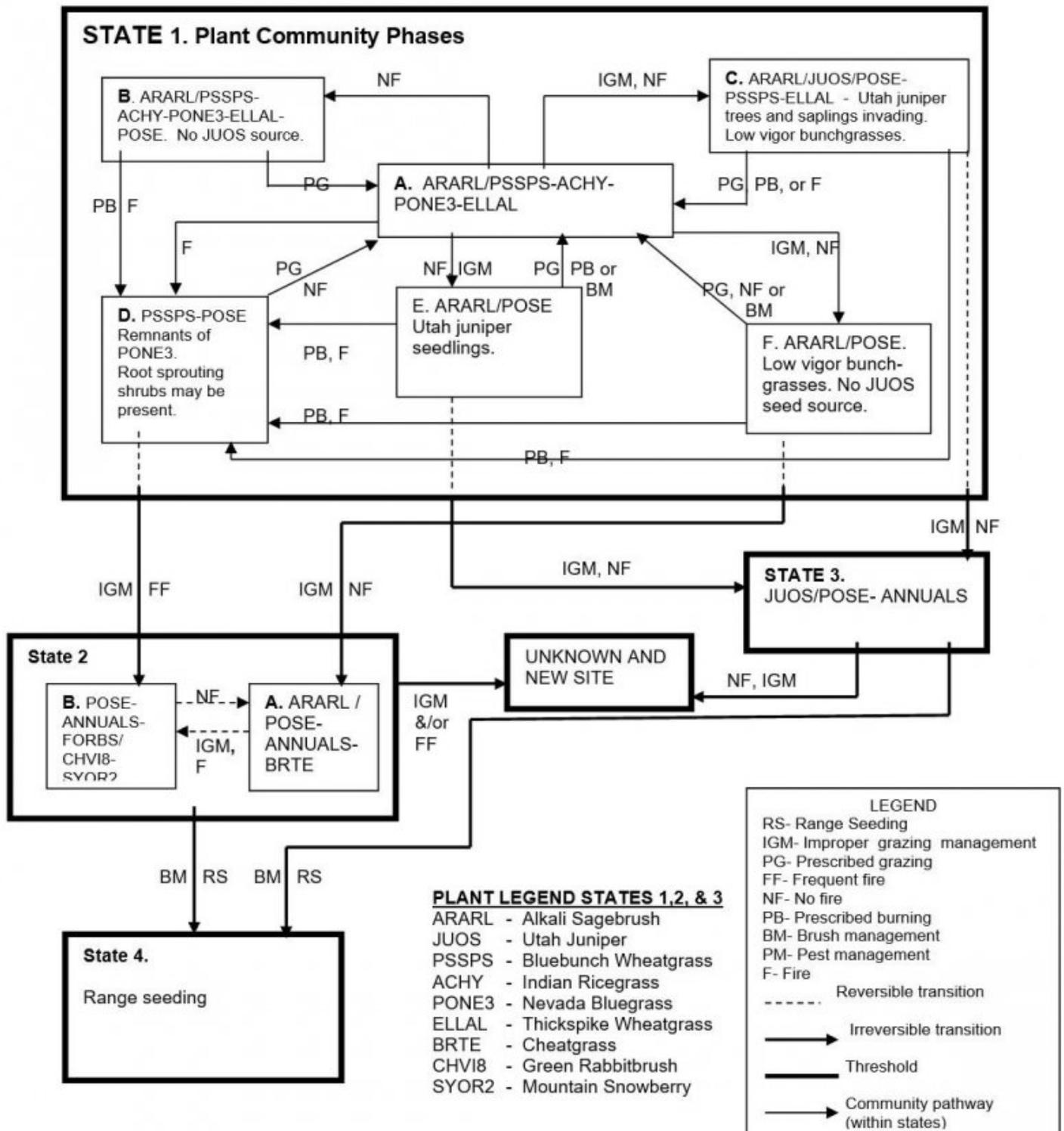
It is usually uneconomical to return this community to State 1 through accelerated practices.

State 2 to State 4 or State 3 to State 4. It is seeded to adapted improved species or native species that attempt to mimic the native plant community. Brush management would be necessary from State 2 and State 3 prior to the range seeding.

Practice Limitations.

Only slight limitations exist on this site for implementing vegetation management, facilitating and accelerating practices.

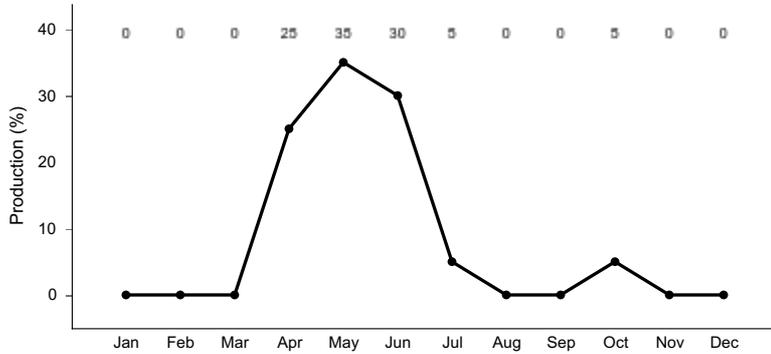
### State and transition model



**State 1**  
**State 1 Phase A**

**Community 1.1**  
**State 1 Phase A**

Reference Plant Community Phase. This plant community is dominated by alkali sagebrush and bluebunch wheatgrass. Subdominant species include Indian ricegrass, Nevada bluegrass, thickspike wheatgrass, Hood's phlox, and biscuitroot. Natural fire frequency is 20-40 years.

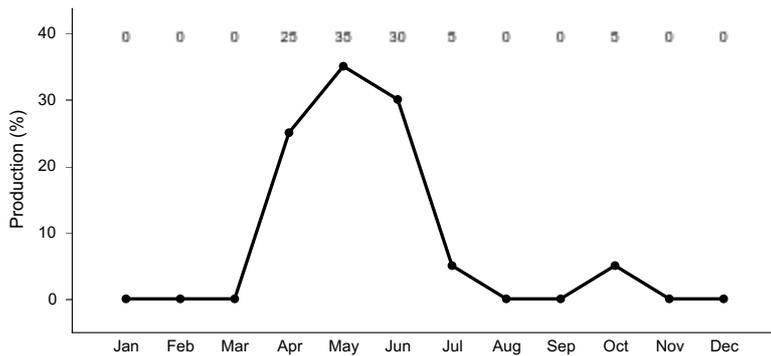


**Figure 3. Plant community growth curve (percent production by month).**  
ID0805, B13 ARTRV . State 1.

**State 2**  
**State 1 Phase B**

**Community 2.1**  
**State 1 Phase B**

This plant community is dominated in the overstory by alkali sagebrush. Bluebunch wheatgrass is the dominant species in the understory. Other perennial grasses and forbs include Indian ricegrass, Nevada bluegrass, thickspike wheatgrass, Sandberg bluegrass, Hood's phlox, and biscuitroot. No Utah juniper seed source is present. This state has developed due to fire frequency being much longer than normal.



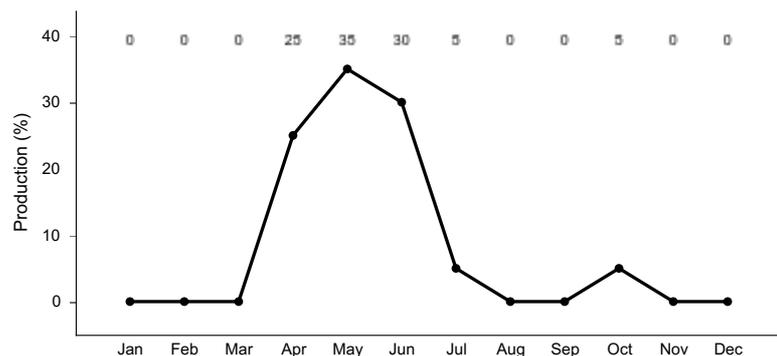
**Figure 4. Plant community growth curve (percent production by month).**  
ID0805, B13 ARTRV . State 1.

**State 3**  
**State 1 Phase C**

**Community 3.1**  
**State 1 Phase C**

This plant community is dominated by alkali sagebrush in the overstory with Utah juniper trees or saplings. Sandberg bluegrass is the dominant grass in the understory. Bluebunch wheatgrass and thickspike wheatgrass are present but in reduced amounts and typically in low vigor. Antelope bitterbrush, when present, is decadent and

hedged. This state has developed due to improper grazing management and lack of fire. A Utah juniper seed source is in the proximity.



**Figure 5. Plant community growth curve (percent production by month). ID0805, B13 ARTRV . State 1.**

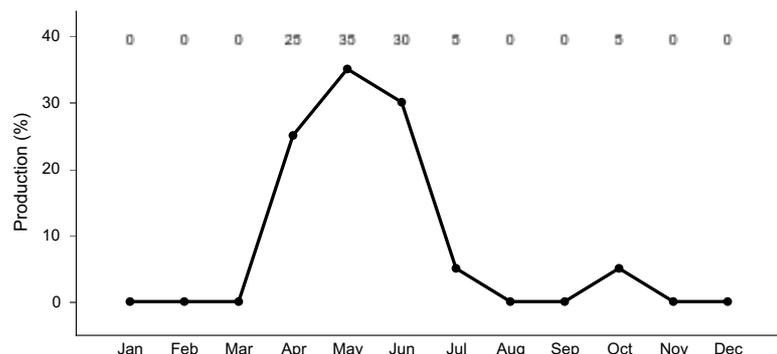
## State 4

### State 1 Phase D

#### Community 4.1

##### State 1 Phase D

This plant community is dominated by bluebunch wheatgrass. Sandberg bluegrass and other perennial grasses and forbs are subdominant. Remnants of Nevada bluegrass and other fine-leaved grasses may be present. Root-sprouting shrubs such as rabbitbrush, and snowberry may be present. This plant community is a result of fire.



**Figure 6. Plant community growth curve (percent production by month). ID0805, B13 ARTRV . State 1.**

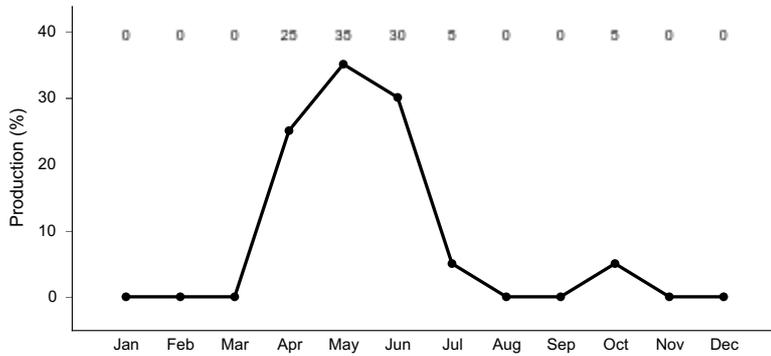
## State 5

### State 1 Phase E

#### Community 5.1

##### State 1 Phase E

This plant community has Utah juniper seedlings and saplings invading the site due to a lack of fire. Alkali sagebrush and Sandberg bluegrass are the dominant understory species. Bitterbrush, when present, is hedged and most of the grasses are in low vigor. A Utah juniper seed source is in the proximity. This state has developed due to the absence of fire and improper grazing management.

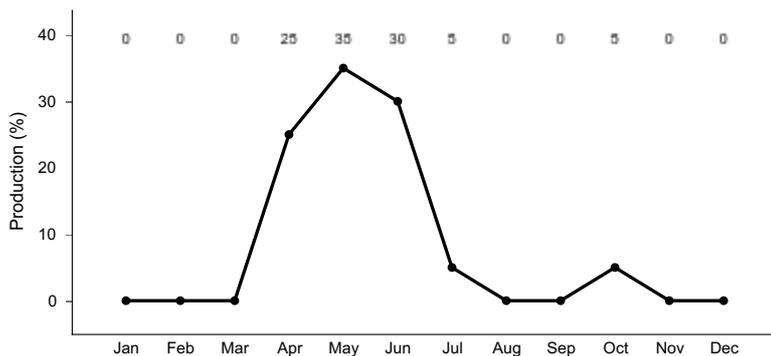


**Figure 7. Plant community growth curve (percent production by month). ID0805, B13 ARTRV . State 1.**

**State 6  
State 1 Phase F**

**Community 6.1  
State 1 Phase F**

This plant community is dominated by alkali sagebrush in the overstory. Sandberg bluegrass is the dominant grass in the understory. Bluebunch wheatgrass, thickspike wheatgrass, and Nevada bluegrass are present but in reduced amounts and typically in low vigor. Antelope bitterbrush, when present, is hedged. This state has developed due to improper grazing management and a lack of fire. No Utah juniper seed source is in the proximity.

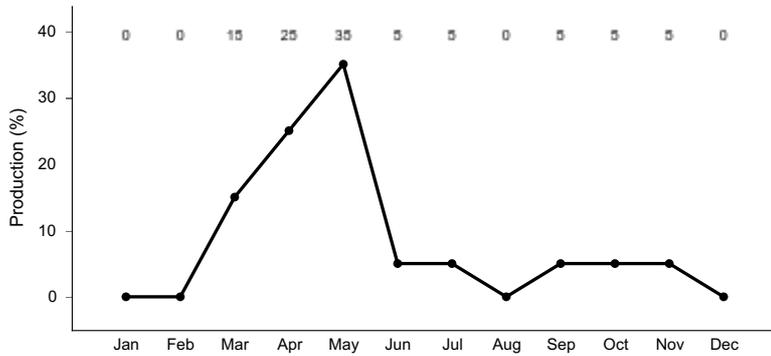


**Figure 8. Plant community growth curve (percent production by month). ID0805, B13 ARTRV . State 1.**

**State 7  
State 2 Phase A**

**Community 7.1  
State 2 Phase A**

This plant community is dominated by alkali sagebrush with Sandberg bluegrass and annuals in the interspaces. Cheatgrass has invaded the plant community. This state has developed due to improper grazing management and the absence of fire from phase F State 1 or with no fire from phase B, State 2. This site has crossed the threshold. It is usually uneconomical to return this community to State1 through accelerated practices.

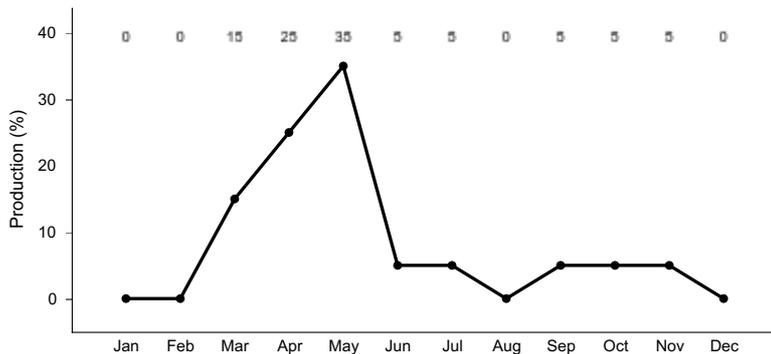


**Figure 9. Plant community growth curve (percent production by month). ID0811, POSE-BRTE/ANNUALS.**

**State 8  
State 2 Phase B**

**Community 8.1  
State 2 Phase B**

This plant community is dominated by Sandberg bluegrass and other annuals and forbs. Root sprouting shrubs such as rabbitbrush and snowberry are present. This state has developed due to improper grazing management and frequent fires from phase D, State 1 or with improper grazing management and fire from phase A, State 2. This site has crossed the threshold. It is usually uneconomical to return this community to State 1 through accelerated practices.



**Figure 10. Plant community growth curve (percent production by month). ID0811, POSE-BRTE/ANNUALS.**

**State 9  
State 3**

**Community 9.1  
State 3**

This plant community is dominated by Utah juniper. Remnants of bluebunch wheatgrass, thickspike wheatgrass, and Nevada bluegrass can be found in the understory, often under trees. Shallow-rooted grasses, such as Sandberg bluegrass, and other annuals can be found in the interspaces. Few shrubs are present. This state has developed with improper grazing management and in the absence of fire. Generally, when shrub cover is below 10-15%, bare ground is above 25-30%, and Utah juniper cover is greater than 20%, the site has crossed the threshold. It is usually uneconomical to return this community to State 1 through accelerated practices.

**State 10  
State 4**

**Community 10.1**

## **State 4**

This state is a range seeding. It is seeded to adapted improved species or native species that attempt to mimic the native plant community.

## **State 11**

### **State 5**

#### **Community 11.1**

##### **State 5**

Unknown new site. This plant community has gone over the threshold to a new site. Site potential has been reduced. Significant soil loss has occurred. Infiltration has been reduced and run-off has become more rapid. This state has developed due to continued improper grazing management and/or frequent fires from State 2 or the continued absence of fire and improper grazing management from State 3 where Utah juniper is dominating the site. This site will not return to State 1 or 2 because of significant soil loss.

## **Additional community tables**

### **Animal community**

Wildlife Interpretations.

#### **Animal Community – Wildlife Interpretations**

This rangeland ecological site provides habitat for a variety of native wildlife species. Large herbivore use of the reference plant community is dominated by mule deer and pronghorn antelope. The site can provide winter habitat for mule deer and antelope. The rangeland provides important seasonal habitat for resident and migratory animals including western toad, sagebrush lizard, shrews, bats, jackrabbits, ground squirrels, mice, coyote, red fox, badger, sage-grouse, Ferruginous hawk, prairie falcon, horned lark, and western meadowlark. Sage-grouse and Idaho pocket gopher are area sensitive species that may be present on this site. In isolated areas encroachment of noxious and invasive plant species (cheatgrass, Russian thistle) can replace native plant species which provide critical feed, brood-rearing, and nesting cover for a variety of native wildlife. Water is limited, being provided only by seasonal runoff, artificial water catchments, and spring sites.

State 1 Phase 1.1 – Alkali Sagebrush/ Bluebunch Wheatgrass/ Indian Ricegrass/ Nevada Bluegrass/ Thickspike Wheatgrass Plant Community (RPC): This plant community provides a diversity of grasses, forbs, and shrubs used by native insect communities that assist in pollination. The reptile and amphibian community is represented by sagebrush lizard, western rattlesnake, northern leopard frog, and western toad. Amphibians are associated with springs and isolated water bodies adjacent to this plant community. Spring developments that capture all available water would preclude the use of these sites by amphibians. Resident or migratory birds using the site include mountain bluebird, lazuli bunting, vesper sparrow, grasshopper sparrow, and lesser goldfinch. Brood-rearing habitat, nesting cover, winter cover, and winter food for sage grouse are provided by this diverse plant community. The plant community provides spring, fall, and winter forage habitat for mule deer and pronghorn. Mule deer and pronghorn have a preference for alkali sagebrush. The south facing slopes provide winter habitat for mule deer and antelope. A diverse small mammal population may include Idaho pocket gopher, golden-mantled ground squirrels, marmots, and chipmunks.

State 1 Phase 1.2- Alkali Sagebrush/ Bluebunch Wheatgrass/ Indian Ricegrass/ Nevada Bluegrass/ Thickspike Wheatgrass/ Sandberg Bluegrass Plant Community: This phase has developed due to fire return intervals being much longer than normal. An increase in canopy cover of sagebrush contributes to a reduced herbaceous understory. Invertebrates' diversity and populations would be similar to those in State 1 Phase 1.1. The reptile community would also be similar to the State 1 Phase 1.1 community represented by sagebrush lizard and western rattlesnake. Sagebrush will provide brood-rearing habitat, nesting, winter cover, and winter food habitat for sage-grouse. The plant community provides seasonal (spring, fall, and winter) forage habitat for mule deer and pronghorn. A diverse small mammal population may include Idaho pocket gopher, golden-mantled ground squirrels, marmots, and chipmunks.

State 1 Phase 1.3 – Alkali Sagebrush/ Utah Juniper/ Sandberg Bluegrass/ Bluebunch Wheatgrass/ Thickspike Wheatgrass Plant Community: This phase has developed due to improper grazing management and a lack of fire. An increase in canopy cover of juniper contributes to a sparse herbaceous understory. A reduced herbaceous understory results in lower diversity and numbers of insects. The reptile community will be similar to the State 1 Phase 1.1 community, represented by common sagebrush lizard and western rattlesnake. The reduced diversity of insects and understory cover may reduce the quality of food and cover for reptiles. As juniper increases, habitat for Brewer's sparrow, sage thrasher, and sage sparrow may increase. Remaining alkali sagebrush provides brood-rearing habitat for sage-grouse, but as juniper encroaches the quality of this habitat is severely reduced or eliminated. The plant community provides limited seasonal (spring, fall and winter) habitat for mule deer and pronghorn. As juniper encroaches the site will provide additional thermal and young of year cover for large mammals. Juniper will increase winter habitat value for mule deer. A small mammal population including golden-mantled ground squirrels, chipmunks, deer mice, and yellow-bellied marmots may utilize this site.

State 1 Phase 1.4 - Bluebunch Wheatgrass/ Sandberg Bluegrass/ Rabbitbrushes Plant Community: This plant community is the result of fire. The plant community, dominated by herbaceous vegetation with little or no sagebrush provides less vertical structure for animals. Insect diversity would be reduced with the loss of sagebrush but a native forb plant community similar to the one in State 1 Phase 1.1 would still support select pollinators. Establishment of rabbitbrush would add fall pollinator habitat and limited winter forage for mule deer. As rabbitbrush matures structural diversity of the site would be enhanced and would help replace the loss of sagebrush. Until rabbitbrush is established, diversity and populations of native reptiles would be limited or excluded. The dominance of herbaceous vegetation with no sagebrush canopy cover would eliminate use of this area for winter cover and winter food by sage-grouse. This plant community provides limited brood-rearing habitat for sage-grouse if the site is adjacent to sagebrush cover. The dominant herbaceous vegetation improves habitat for grassland avian species (horned lark, western meadowlark, vesper sparrow, and grasshopper sparrow). Winter habitat for pronghorn and mule deer would be reduced or eliminated with the loss of sagebrush. Small mammal diversity and populations would be reduced due to a loss of cover and subsequent increase in success of hunting by predators.

State 1 Phase 1.5 - Alkali Sagebrush/ Sandberg Bluegrass/ Utah Juniper Plant Community: This phase has developed due to improper grazing management and a lack of fire. An increase in canopy cover of juniper and improper grazing management contributes to a sparse herbaceous understory. A less diverse herbaceous understory results in lower diversity and numbers of insects. The reptile community will be similar to the State 1 Phase 1.3 community, represented by common sagebrush lizard and western rattlesnake. The reduced diversity of insects and understory cover will reduce quality of food and cover for reptiles. As juniper increases, habitat for Brewer's sparrow, sage thrasher, and sage sparrow may increase. Remaining alkali sagebrush provides brood-rearing habitat for sage-grouse, but as juniper encroaches the quality of this habitat is severely reduced or eliminated. The plant community provides a shorter forage season in the spring and fall for mule deer and pronghorn, due to the loss of native perennial grasses. As juniper encroaches, the site will provide additional thermal and young of year cover for large mammals. Juniper will increase winter habitat value for mule deer. A small mammal population including golden-mantled ground squirrels, chipmunks, deer mice, and yellow-bellied marmots may utilize this site.

State 1 Phase 1.6 - Alkali Sagebrush/ Sandberg Bluegrass Plant Community: This phase has developed due to improper grazing management and a lack of fire. An increase in canopy cover of sagebrush contributes to a sparse herbaceous understory. A reduced herbaceous understory results in lower diversity and numbers of insects. The reptile community will be similar to the State 1 Phase 1.2 community represented by sagebrush lizard and western rattlesnake. The reduced diversity of insects and understory cover may reduce the quality of food and cover for reptile populations. As sagebrush increases, habitat for Brewer's sparrow and sage thrasher may increase. Quality of brood-rearing habitat and nesting cover for sage-grouse would decline with the loss of many forbs and deep-rooted perennial bunch grasses. Winter cover and winter food for sage-grouse would still be provided. South and west facing slopes provide winter habitat for mule deer and pronghorn. The small mammal population may include Idaho pocket gopher, golden-mantled ground squirrels, and chipmunks.

State 2 Phase 2.1 - Alkali Sagebrush/ Sandberg Bluegrass/ Annuals/ Cheatgrass Plant Community: This phase has developed due to improper grazing management and a lack of fire. An increase in canopy cover of sagebrush and invasive plants contributes to a sparse native herbaceous understory. A reduced herbaceous understory results in lower diversity and numbers of insects. The reptile community will be similar to the one in State 1 Phase 1.6, but the quality of habitat has been severely reduced. As sagebrush increases, habitat for Brewer's sparrow and sage

thrasher may increase. Quality of brood-rearing habitat for sage-grouse would decline with the loss of native forbs and deep-rooted perennial bunch grasses. Winter cover and winter food for sage-grouse would still be provided. The plant community supports winter forage habitat for mule deer and pronghorn. Quality of forage habitat for mule deer and pronghorn in spring and fall is reduced. The small mammal population would include Idaho pocket gopher, golden-mantled ground squirrels, and chipmunks.

**State 2 Phase 2.2 - Sandberg Bluegrass/ Annuals/ Forbs/ Green Rabbitbrush/ Mountain Snowberry Plant Community:** This plant community is the result of continued improper grazing management and fire. Pollinator habitat may be similar to that in State 1 Phase 1.2. Reptile species would be similar to those in State 2 Phase 2.1 with vertical structure provided by rabbitbrush and snowberry. This plant community does not support the habitat requirements for sage-grouse. Birds of prey including hawks and falcons may range throughout these areas looking for prey species. Mule deer and pronghorn may utilize the herbaceous vegetation in the early part of the year when the invasive annuals (cheatgrass) are more palatable. Mountain snowberry is desirable browse for the entire year for mule deer and pronghorn. Small mammal populations and diversity would be similar to those in State 1 Phase 1.2.

**State 3 – Utah Juniper/ Sandberg Bluegrass/ Annuals:** This state has developed due to improper grazing management and no fire. The loss of native understory vegetation will reduce insect diversity on the site. The lack of flowering plants reduces the quality of pollinator habitat for butterflies and moths. The quality of habitat for reptiles is severely reduced resulting in a less diverse population. This plant community does not support the habitat requirements for sage-grouse. Birds using this site as resident or migratory habitat include Juniper titmouse, western bluebird, and Virginia's warbler. The Juniper titmouse relies heavily on juniper seeds for winter food. Hunting success by raptors may decrease due to a heavy overstory of juniper. The plant community supports limited seasonal habitat for mule deer in the spring and fall. Winter habitat for mule deer may increase in value as juniper becomes established. As juniper encroaches, the site will provide additional thermal and young of year cover for large mammals.

**State 4 – Range Seeding Plant Community:** The proposed seeding mixture (native or non-native) would determine the animal species that would utilize the area. A diverse seed mixture of grasses and forbs would provide similar habitat conditions as in the herbaceous plant community described in State 1 Phase 1.4. A diverse seed mixture of grasses, forbs, and shrubs would provide similar habitat conditions as described in State 1 Phase 1.1 or 1.2. A monoculture of non-native grass species would not support diverse populations of insects, reptiles, birds, or mammals. Grassland animal species including western meadowlark, horned lark, savannah sparrow, deer mouse, and kangaroo rat would utilize this site for nesting and/or feeding. Mule deer and pronghorn may utilize the site in the spring and fall for forage. Birds of prey including hawks and falcons may range throughout these areas looking for prey species.

#### Grazing Interpretations.

This site is suited for grazing by domestic livestock in the summer and fall. Natural water supply is short or absent, however water may be available on adjacent sites.

Estimated initial stocking rate will be determined with the landowner or decision-maker. They will be based on the inventory which includes species, composition, similarity index, production, past use history, season of use, and seasonal preference. Calculations used to determine estimated initial stocking rate will be based on forage preference ratings.

### **Hydrological functions**

Soils on this site are in hydrologic group D. The site has high run-off potential.

### **Recreational uses**

This site provides open space on rolling slopes and lower mountain-side slopes with a varied floristic component.

### **Wood products**

none.

## Other products

none.

## Other information

Field Offices

American Falls, ID  
Blackfoot, ID  
Burley, ID  
Driggs, ID  
Fort Hall, ID  
Idaho Falls, ID  
Malad, ID  
Pocatello, ID  
Rexburg, ID  
Soda Springs, ID  
St. Anthony, ID

## Inventory data references

Information presented here has been derived from NRCS clipping and other inventory data. Also, field knowledge of range-trained personnel was used. Those involved in developing this site description include:

Dave Franzen, co-owner, Intermountain Rangeland Consultants, LLC  
Jacy Gibbs, co-owner, Intermountain Rangeland Consultants, LLC  
Jim Cornwell, Range Management Specialist, IASCD  
Brendan Brazee, State Rangeland Management Specialist, NRCS, Idaho  
Lee Brooks, Range Management Specialist, IASCD  
Kristen May, Resource Soil Scientist, NRCS, Idaho

## Type locality

Location 1: Bear Lake County, ID	
Township/Range/Section	T16S R45E S6

## Other references

Hironaka, M., M.A. Fosberg, A. H. Winward. 1983. Sagebrush-Grass Habitat Types of Southern Idaho. University of Idaho, Moscow, Idaho. Bulletin Number "35".  
Petersen, S.L., 2004. A Landscape-Scale Assessment of Plant Communities, Hydrologic Processes, and State-and-Transition Theory in a Western Juniper Dominated Ecosystem. PhD Dissertation; Oregon State University, Corvallis, Oregon.

USDA Forest Service, Rocky Mountain Research Station. 2004. Restoring Western Ranges and Wildlands. General Technical Report RMRS-GTR-136-vols. 1-3.

USDA, NRCS.2001. The PLANTS Database, Version 3.1 (<http://plants.usda.gov>). National Plant Data Center, Baton Rouge, LA 70874-4490 USA.

USDA, Forest Service, Fire Effects Information Database. 2004. [www.fs.fed.us/database](http://www.fs.fed.us/database).

USDI Bureau of Land Management, US Geological Survey; USDA Natural Resources Conservation Service, Agricultural Research Service; Interpreting Indicators of Rangeland Health. Technical Reference 1734-6; Version 4-2005.

## Approval

## Rangeland health reference sheet

Interpreting Indicators of Rangeland Health is a qualitative assessment protocol used to determine ecosystem condition based on benchmark characteristics described in the Reference Sheet. A suite of 17 (or more) indicators are typically considered in an assessment. The ecological site(s) representative of an assessment location must be known prior to applying the protocol and must be verified based on soils and climate. Current plant community cannot be used to identify the ecological site.

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Contact for lead author	Brendan Brazee, State Rangeland Management Specialist USDA-NRCS 9173 W. Barnes Drive, Suite C, Boise, ID 83709
Date	05/06/2008
Approved by	Kendra Moseley
Approval date	
Composition (Indicators 10 and 12) based on	Annual Production

## Indicators

- 1. Number and extent of rills:** rills rarely occur on this site. If rills are present they are most likely to occur on steeper slopes greater than 15% and immediately following wildfire. Rills are most likely to occur on soils with surface textures of silt loam and clay loam.

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- 2. Presence of water flow patterns:** water flow patterns rarely occur on this site except on slopes greater than 15%. When they occur they are short, disrupted by surface gravel, cool season perennial grasses, and tall shrubs and are not extensive.

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- 3. Number and height of erosional pedestals or terracettes:** both are rare on this site. In areas of >15% slopes where flow patterns and /or rills are present, a few pedestals may be expected.

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- 4. Bare ground from Ecological Site Description or other studies (rock, litter, lichen, moss, plant canopy are not bare ground):** may range from 30-45 percent.

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- 5. Number of gullies and erosion associated with gullies:** do not occur on this site.

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- 6. Extent of wind scoured, blowouts and/or depositional areas:** does not occur.

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- 7. Amount of litter movement (describe size and distance expected to travel):** fine litter moves by wind or water. Fine litter can move up to 2 feet after a strong summertime convection storm. Due to the flat slopes, large litter does not

move.

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8. **Soil surface (top few mm) resistance to erosion (stability values are averages - most sites will show a range of values):** values should range from 4 to 6 but needs to be tested.
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9. **Soil surface structure and SOM content (include type of structure and A-horizon color and thickness):** structure ranges from weak very fine and fine granular to weak and moderate medium platy to moderate fine and medium subangular blocky. Soil organic matter (SOM) ranges from 1 to 2 percent. Surface color is generally brown to dark grayish brown. The A or A1 horizon is typically 3 to 6 inches thick.
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10. **Effect of community phase composition (relative proportion of different functional groups) and spatial distribution on infiltration and runoff:** bunchgrasses, especially deep rooted perennials, slow runoff and increase infiltration.
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11. **Presence and thickness of compaction layer (usually none; describe soil profile features which may be mistaken for compaction on this site):** not present.
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12. **Functional/Structural Groups (list in order of descending dominance by above-ground annual-production or live foliar cover using symbols: >>, >, = to indicate much greater than, greater than, and equal to):**

Dominant: cool season deep-rooted perennial bunchgrasses

Sub-dominant: medium shrubs

Other: perennial forbs

Additional: shallow rooted bunchgrasses

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13. **Amount of plant mortality and decadence (include which functional groups are expected to show mortality or decadence):** very little mortality or decadence is expected on this site. Mortality of shallow rooted grasses may occur due to extended periods of drought.
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14. **Average percent litter cover (%) and depth ( in):** additional data is needed but is expected to be low and at a shallow depth.
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15. **Expected annual annual-production (this is TOTAL above-ground annual-production, not just forage annual-production):** is 900 pounds per acre (1008Kg/ha) in a year with normal precipitation and temperatures. Perennial grasses produce 45-55 percent of the total production, forbs 10-20 percent and shrubs 30-40 percent.
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16. **Potential invasive (including noxious) species (native and non-native).** List species which **BOTH** characterize degraded states and have the potential to become a dominant or co-dominant species on the ecological site if their future establishment and growth is not actively controlled by management interventions. Species that become dominant for only one to several years (e.g., short-term response to drought or wildfire) are not invasive plants. Note that unlike other indicators, we are describing what is **NOT** expected in the reference state for the ecological site: includes cheatgrass, *Vulpia* species, halogeton, Russian thistle, yellow salsify, and annual mustards.
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17. **Perennial plant reproductive capability:** all functional groups have the potential to reproduce in normal years.
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